

I Claim:

1. A spherical rotary engine valve assembly for a combustion cylinder in an internal combustion engine, comprising:
  - a valve mounted for rotation and having a spherical shape with an opening formed within an outer surface of the valve, the opening having a shaped surface including a convex portion and a concave portion;
  - a seal having a first and second rings for sealing an interface between said valve and the combustion chamber, a force exerted on a portion of said first ring causing a force between said second ring and said valve outer surface; and
  - a contoured piston head formed on a piston operating within the combustion chamber, said contoured piston head having a first concave section generally conforming to a shape of said valve, and a second concave section having a deeper recess than said first concave section.
2. A spherical rotary engine valve assembly as recited in claim 1, further comprising a valve housing positioned adjacent said valve on a side of said valve generally opposite from the cylinder, a gap being defined between said valve and said valve housing, said valve

housing including a trench for preventing a flow of gas in a direction within said gap.